



**BRIGHTTEK**  
**BRIGHTTEK (EUROPE) LIMITED**

*Brighten Up The World With LED!*



ISO/TS 16949:2009



BS EN ISO 14001:2004



QC 080000 IECQ HSPM

## PRODUCT DATASHEET

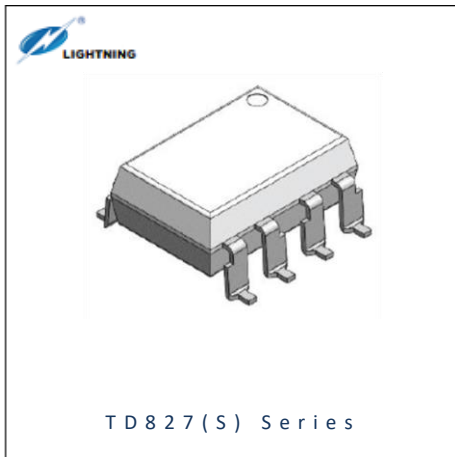


- ▶ DC Input Photo Coupler
- ▶ SMD8
- ▶ Photo Transistor

# TD827(S)(T1)-GV



Release Date: 13 December 2024 Version: A00



## TD827(S) Series



### DESCRIPTION:

The TD827(S) series provide two channel operation, and each combines an AlGaAs infrared emitting diode as the emitter which is optically coupled to a silicon planar phototransistor detector in a plastic DIP8 package with with SMD8 lead forming option.

With the robust coplanar double mold structure, TD827 series provide the most stable isolation feature.

### FEATURES:

- High isolation 5000 Vrms
- DC input with transistor output
- Operating temperature range -55°C to +110°C
- MSL class 1
- Regulatory Approvals:
  - UL - UL1577
  - VDE - EN60747-5-5 (VDE0884-5)
  - CQC - GB4943.1, GB8898
  - cUL - CSA Component Acceptance Service Notice 5A

### APPLICATIONS:

- Computer peripheral interface
- Microprocessor system interface



Partner with: LIGHTNING

**NAMING & ORDERING INFORMATION:**


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Naming Information:

|                             |  |
|-----------------------------|--|
| <b>TD827 (S) (T1) - G V</b> |  |
| <b>TD827</b>                | Part Number                                      |
| <b>S</b>                    | Lead Form Option: SMD8                           |
| <b>T1</b>                   | Selection: Tape and Reel Option (T1(default)/T2) |
| <b>G</b>                    | Green Option                                     |
| <b>V</b>                    | VDE Option                                       |

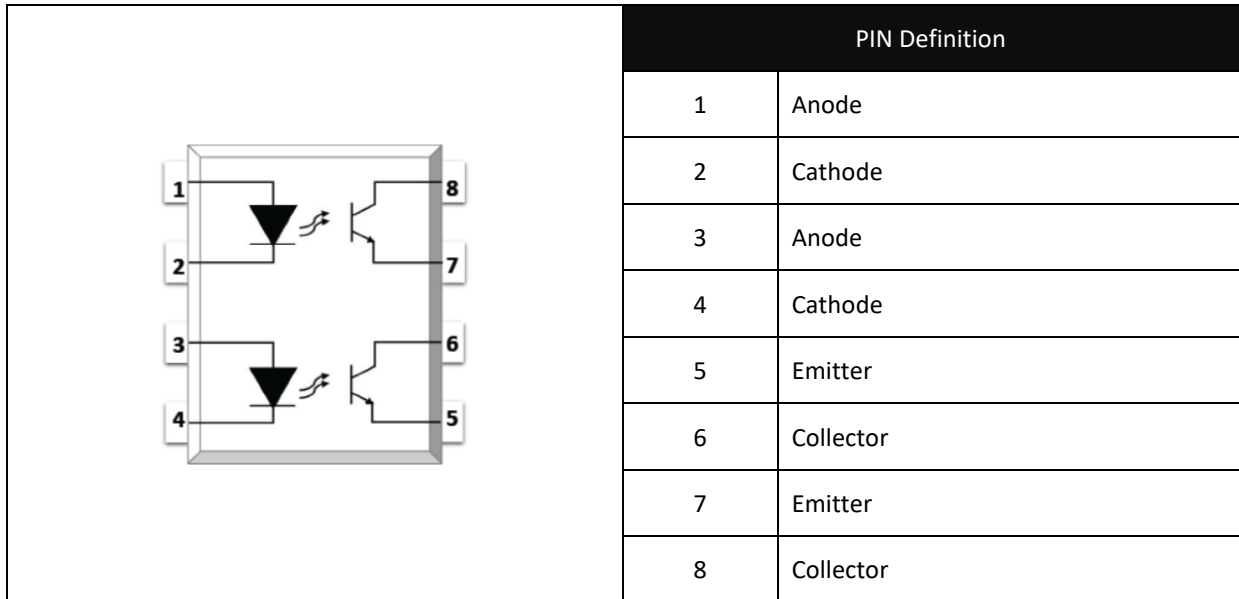
Ordering Information:

| <b>TD827(S)(T1)-GV</b> |        |        |      |      |      |  |
|------------------------|--------|--------|------|------|------|--|
| Part Number            | Symbol | Values |      |      | Unit | Test Condition                           |
|                        |        | Min.   | Typ. | Max. |      |  |
| TD827(S)(T1)-GV        | CTR    | 130    | ---  | 400  | %    | I <sub>F</sub> =5mA, V <sub>CE</sub> =5V |

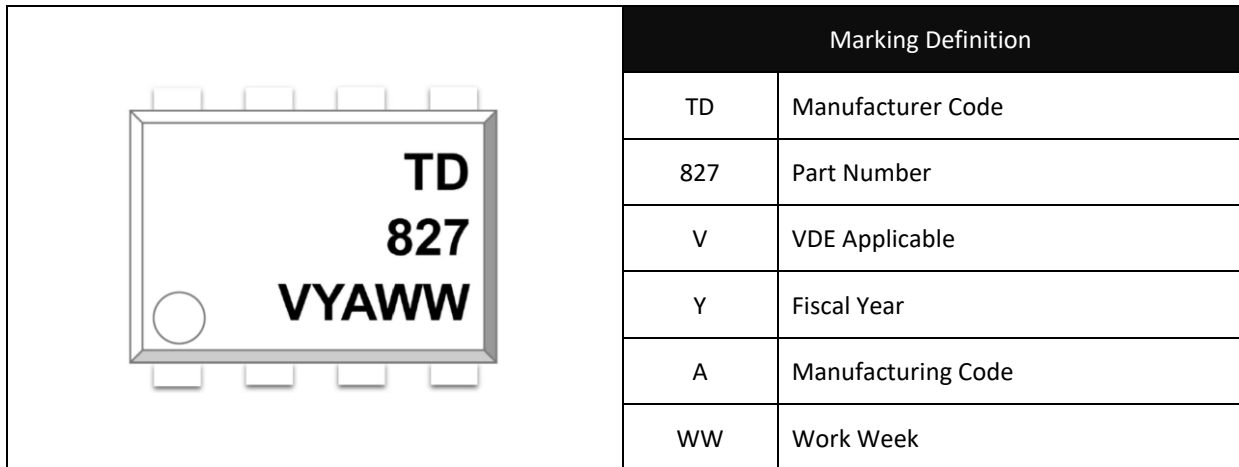
| Version No. | Original Release Date |
|-------------|-----------------------|
| Rev: A00    | 29/08/2024            |

## SCHEMATIC DIAGRAM & MARKING:

Schematic Diagram:



Marking Information:



Labelling Information:

|  |   |   |
|--|---|---|
|  <b>福建天电光电有限公司</b><br>FUJIAN LIGHTNING OPTOELECTRONIC CO.,LTD<br>Part No.:XXXXXXXXX Bin Code: X<br><br>Lot No.: XXXXXXXXXXXX<br>Date Code: XXXX<br>QTY: XXX PCS<br><br>MSL: 1<br>Made in Quanzhou Fujian<br>     | This product is manufactured, tested, and packed by |  |
|--|---|---|

## ABSOLUTE CHARACTERISTICS:

### Absolute Maximum Ratings:

| Parameter                   | Symbol    | Ratings             | Unit             |
|-----------------------------|-----------|---------------------|------------------|
| INPUT                       |           |                     |                  |
| Forward Current             | $I_F$     | 60                  | mA               |
| Peak Forward Current        | $I_{FP}$  | 1 * <sup>1</sup>    | A                |
| Reverse Voltage             | $V_R$     | 6                   | V                |
| Input Power Dissipation     | $P_i$     | 100                 | mW               |
| OUTPUT                      |           |                     |                  |
| Collector - Emitter Voltage | $V_{CEO}$ | 80                  | V                |
| Emitter - Collector Voltage | $V_{ECO}$ | 6                   | V                |
| Collector Current           | $I_c$     | 50                  | mA               |
| Output Power Dissipation    | $P_o$     | 150                 | mW               |
| COMMON                      |           |                     |                  |
| Total Power Dissipation     | $P_{tot}$ | 200                 | mW               |
| Isolation Voltage           | $V_{iso}$ | 5000 * <sup>2</sup> | V <sub>rms</sub> |
| Operating Temperature       | $T_{opr}$ | -55~+110            | °C               |
| Storage Temperature         | $T_{stg}$ | -55~+125            | °C               |
| Soldering Temperature       | $T_{sol}$ | 260 * <sup>3</sup>  | °C               |

\*1. 100µs pulse, 100Hz frequency

\*2. AC for 1 minute, R.H.=40~60%

\*3. For 10 seconds max.

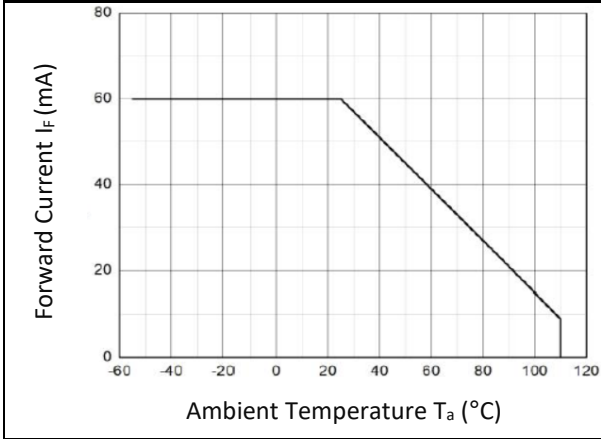
## ELECTRICAL CHARACTERISTICS:

Electrical Optical Characteristics at Ta=25°C:

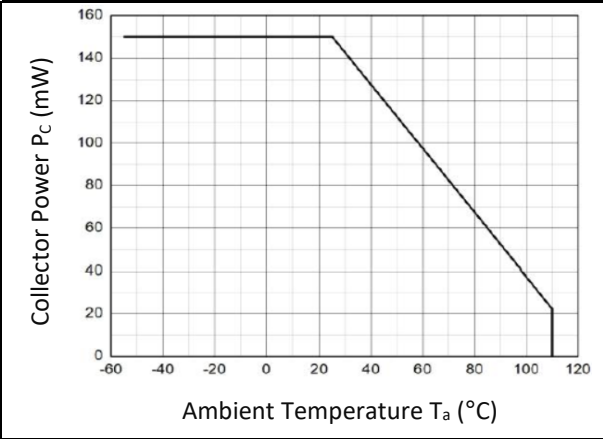
| Parameter                             | Symbol            | Values               |                  |                  | Unit | Test Condition                             |  |
|---------------------------------------|-------------------|----------------------|------------------|------------------|------|--|--|
|                                       |                   | Min.                 | Typ.             | Max.             |      |  |  |
| <b>INPUT</b>                          |                   |                      |                  |                  |      |  |  |
| Forward Voltage                       | V <sub>F</sub>    | ---                  | 1.24             | 1.4              | V    | I <sub>F</sub> =10mA                       |  |
| Reverse Current                       | I <sub>R</sub>    | ---                  | ---              | 10               | μA   | V <sub>R</sub> =6V                         |  |
| Input Capacitance                     | C <sub>IN</sub>   | ---                  | 10               | ---              | pF   | V=0, f=1kHz                                |  |
| <b>OUTPUT</b>                         |                   |                      |                  |                  |      |  |  |
| Collector Dark Current                | I <sub>CEO</sub>  | ---                  | ---              | 100              | nA   | I <sub>F</sub> =0mA, V <sub>CE</sub> =20V  |  |
| Collector - Emitter Breakdown Voltage | BV <sub>CEO</sub> | 80                   | ---              | ---              | V    | I <sub>C</sub> =0.1mA, I <sub>F</sub> =0mA |  |
| Emitter - Collector Breakdown Voltage | BV <sub>ECO</sub> | 6                    | ---              | ---              | V    | I <sub>E</sub> =0.1mA, I <sub>F</sub> =0mA |  |
| <b>TRANSFER CHARACTERISTICS</b>       |                   |                      |                  |                  |      |  |  |
| Current Transfer Rate                 | TD827             | CTR                  | 130              | ---              | 400  | %  | I <sub>F</sub> =5mA, V <sub>CE</sub> =5V                               |
| Collector-Emitter Saturation Voltage  |                   | V <sub>CE(sat)</sub> | ---              | 0.06             | 0.2  | V  | I <sub>F</sub> =20mA, I <sub>C</sub> =1mA                              |
| Isolation Resistance                  |                   | R <sub>ISO</sub>     | 10 <sup>12</sup> | 10 <sup>14</sup> | ---  | Ω  | DC=500V,<br>40~60% R.H.  |
| Floating Capacitance                  |                   | C <sub>IO</sub>      | ---              | 0.4              | 1    | pF   | V=0, f=1MHz  |
| Response Time (Rise)                  |                   | t <sub>r</sub>       | ---              | 3                | 18   | μs   | V <sub>CE</sub> =2V, I <sub>C</sub> =2mA<br>R <sub>L</sub> =100Ω       |
| Response Time (Fall)                  |                   | t <sub>f</sub>       | ---              | 4                | 18   | μs   |  |
| Cut-off Frequency                     |                   | f <sub>c</sub>       | ---              | 80               | ---  | kHz  | V <sub>CE</sub> =2V, I <sub>C</sub> =2mA<br>R <sub>L</sub> =100Ω, -3dB |

### CHARACTERISTIC CURVES:

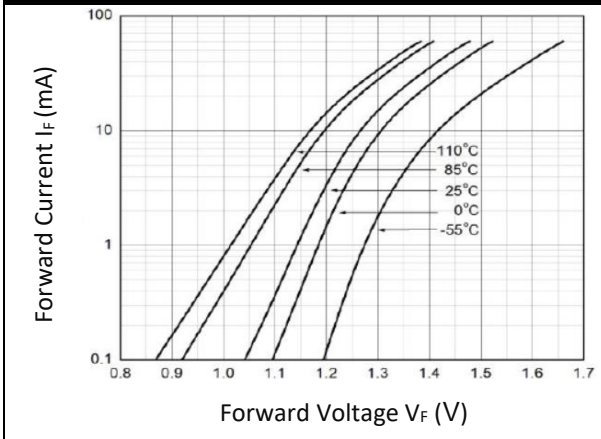
Forward Current v.s. Ambient Temperature



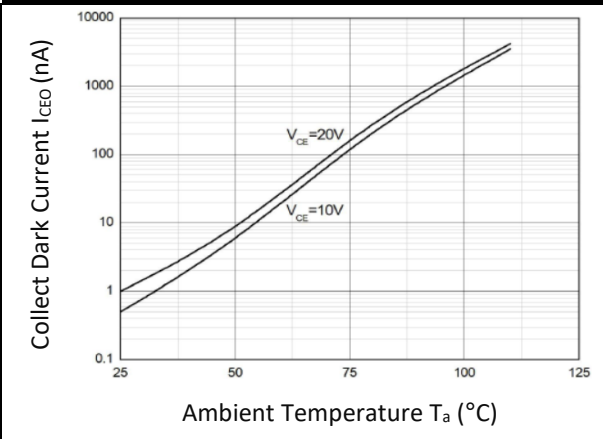
Collector Power Dissipation v.s. Ambient Temp.



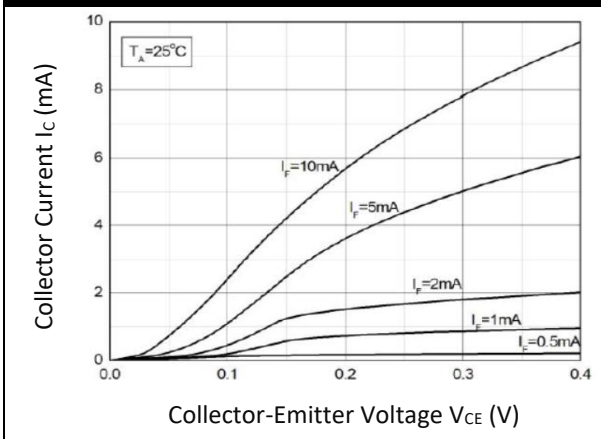
Forward Current v.s. Forward Voltage



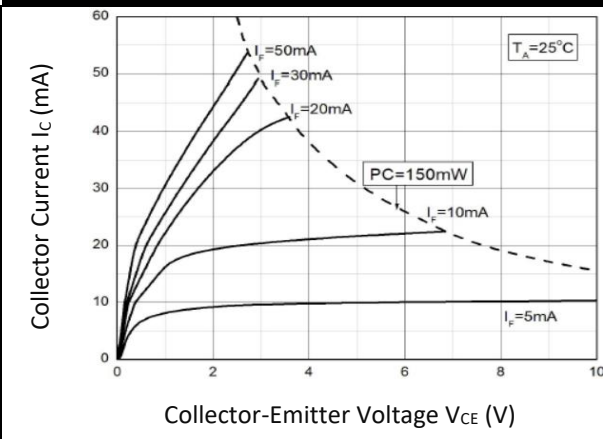
Collector Dark Current v.s. Ambient Temperature



Collector Current v.s. Collector-Emitter Voltage

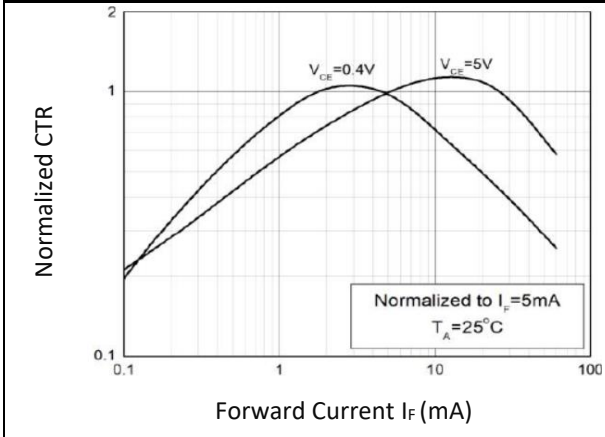


Collector Current v.s. Collector-Emitter Voltage

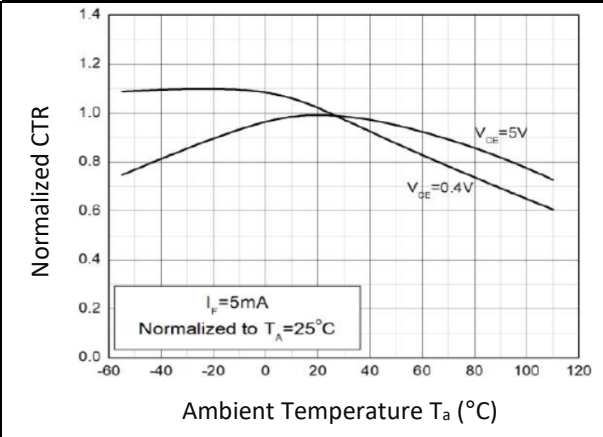


## CHARACTERISTIC CURVES:

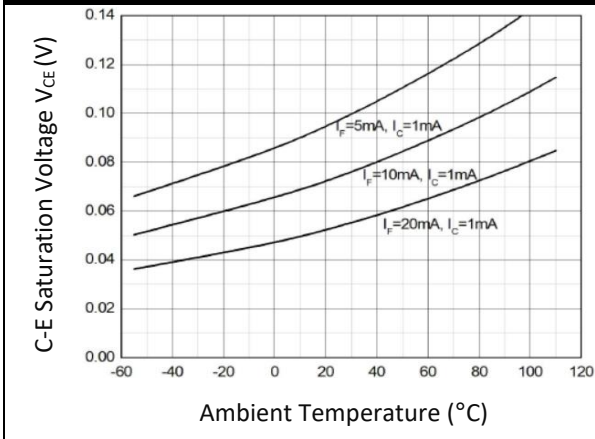
Normalized Current Transfer Ratio v.s. Forward Current



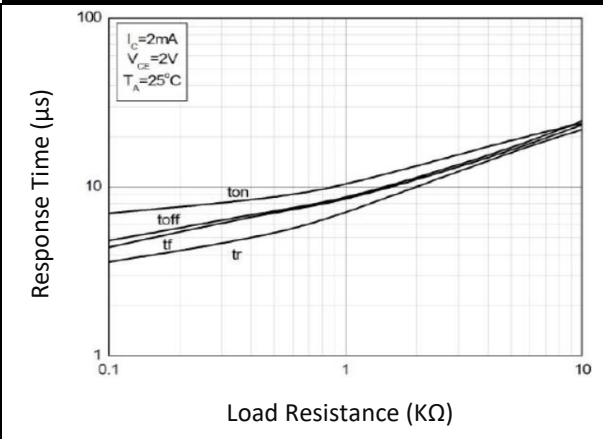
Normalized Current Transfer Ratio v.s. Ambient Temperature



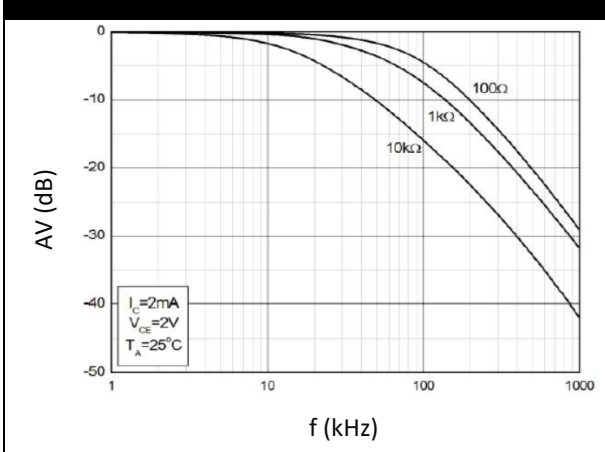
Collector-Emitter Saturation Voltage v.s. Ambient Temperature



Switching Time v.s. Load Resistance

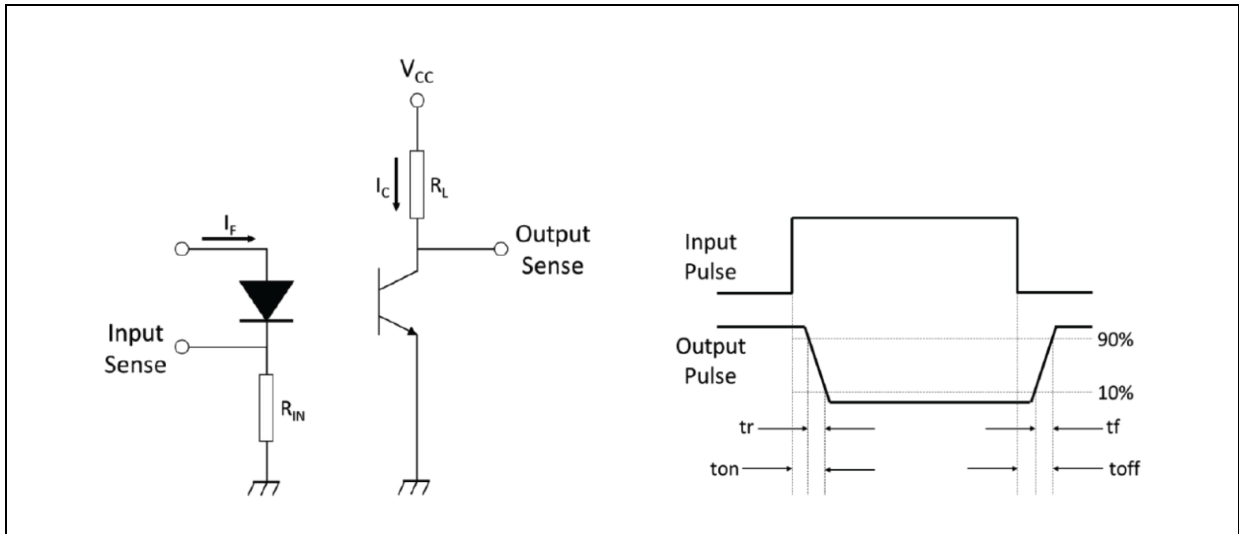


Frequency Response

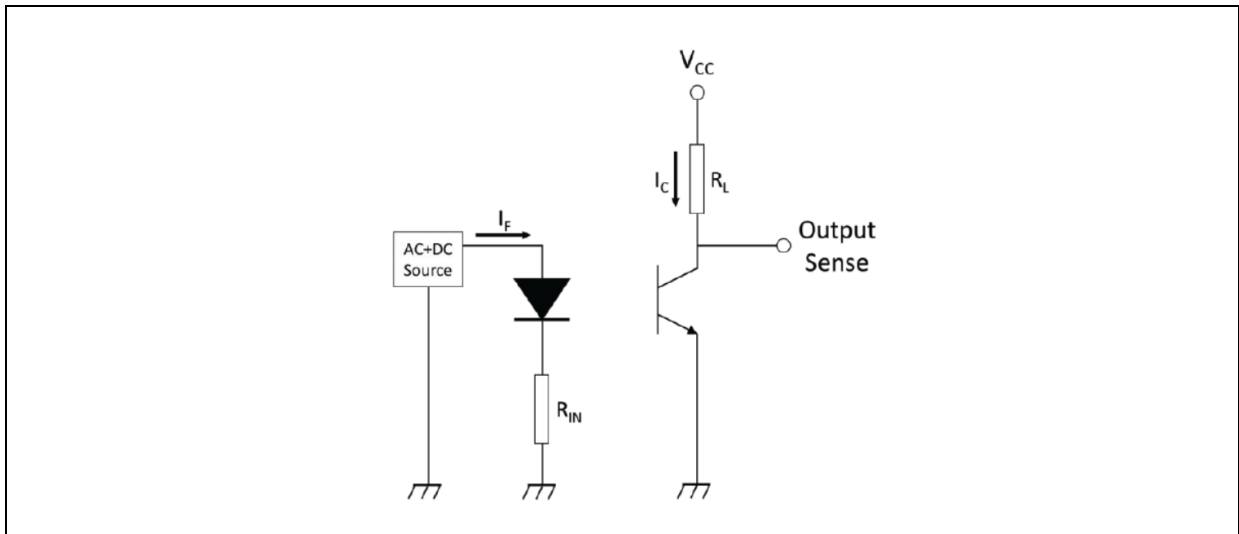


## TEST CIRCUIT:

### Test Circuit of Response Time:



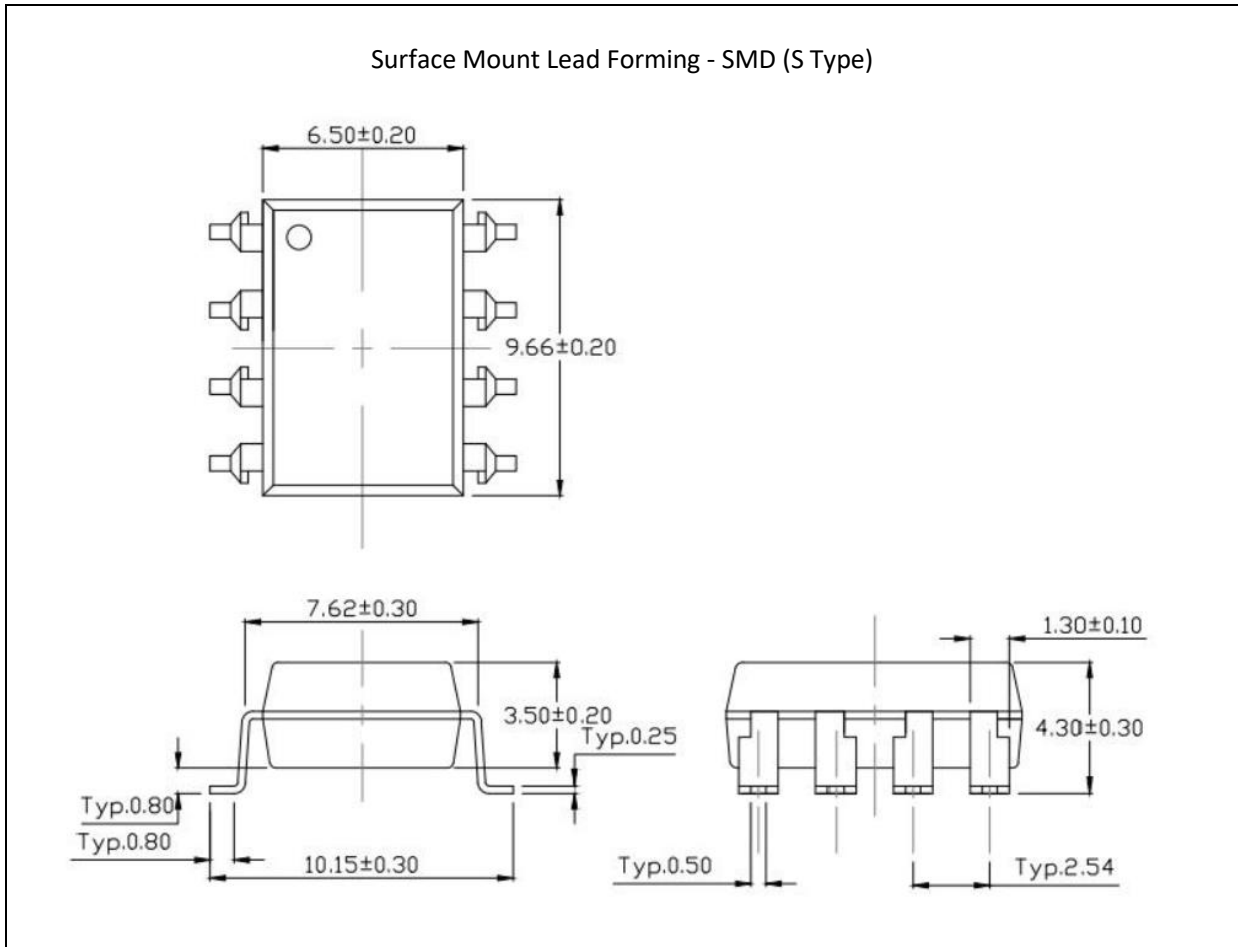
### Test Circuit of Frequency Response:





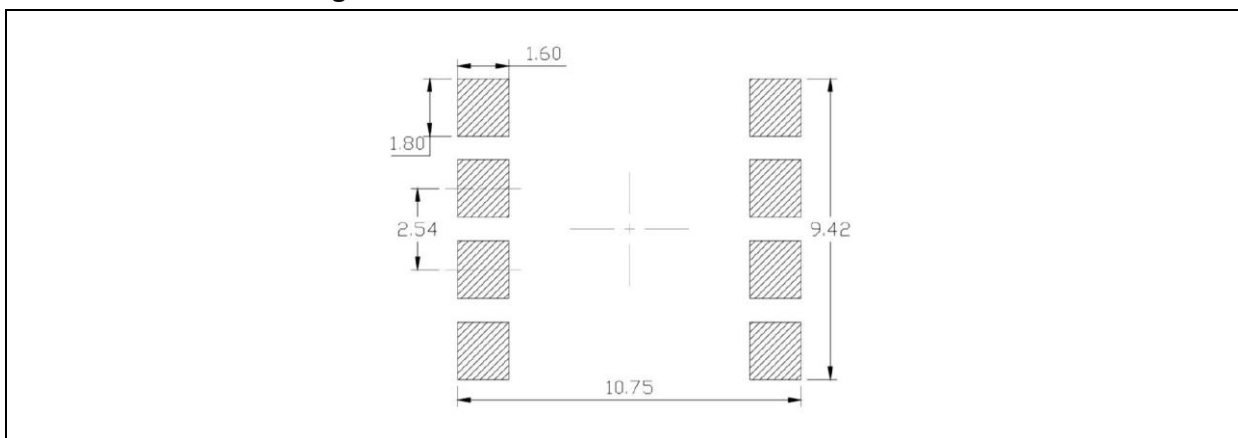
## OUTLINE DIMENSION:

Package Dimension:



1. All dimensions are in millimetre (mm).

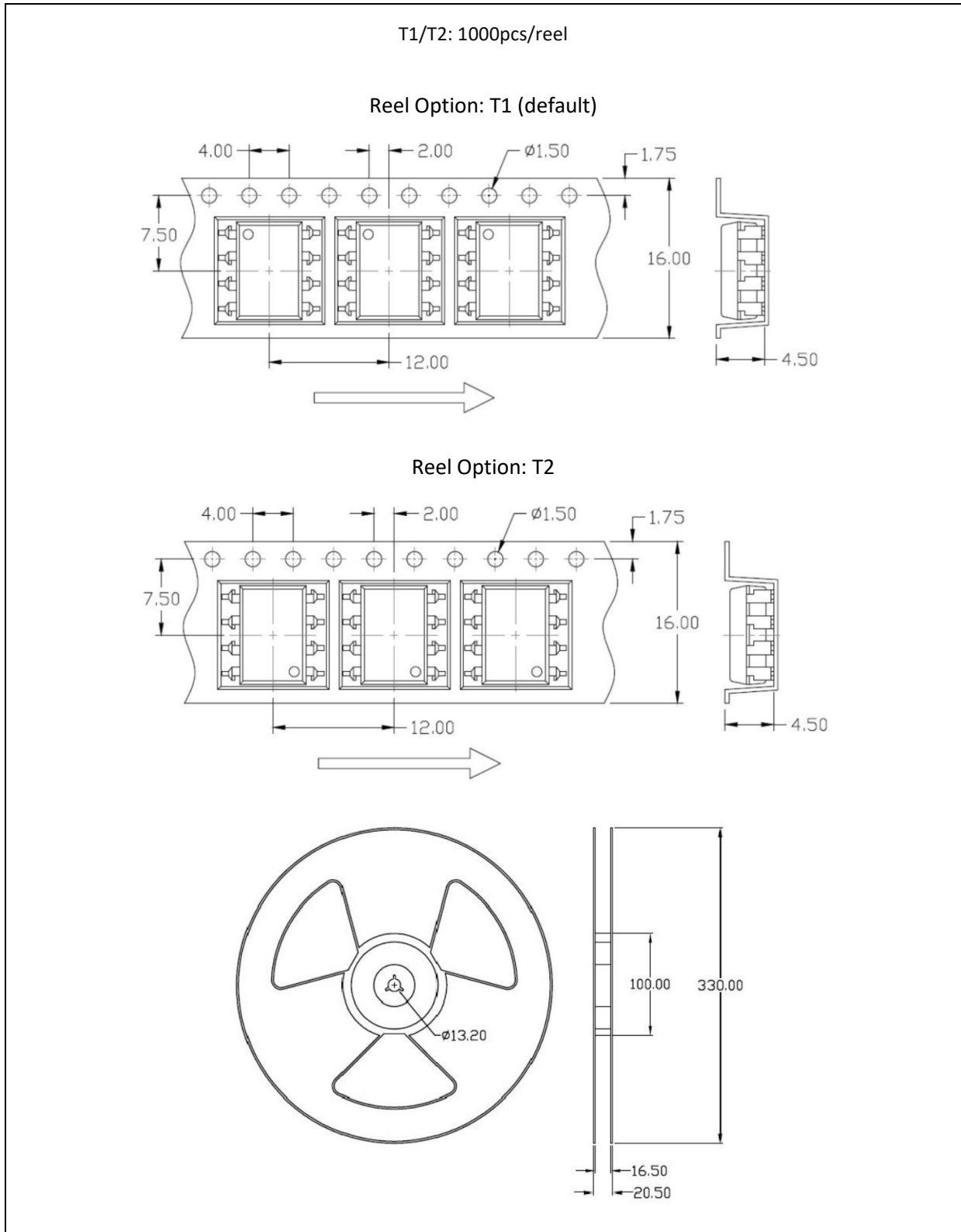
Recommended Soldering Mask:



1. Dimensions are in millimetre (mm).

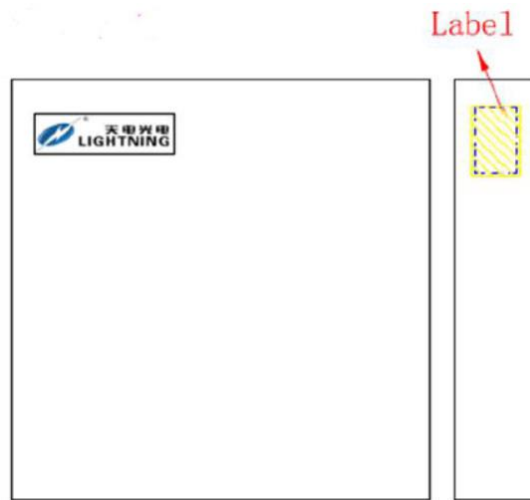
## PACKING SPECIFICATION:

Reel Dimension:

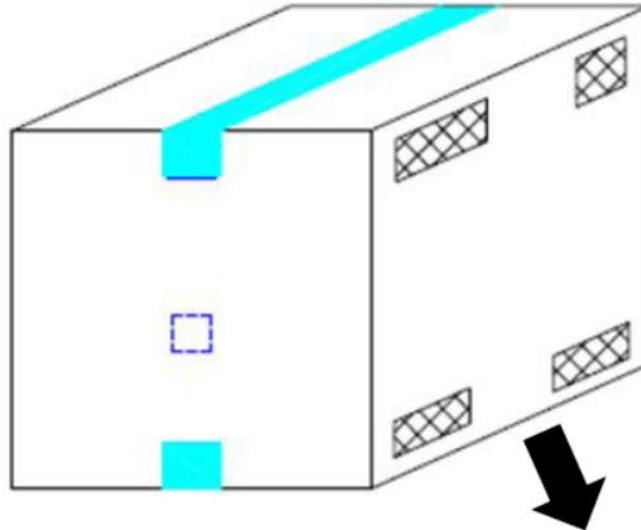


Box Dimension:

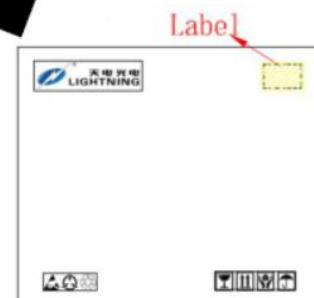
T1/T2: 3 reels (3Kpcs)/inner box, 5 inner boxes (15Kpcs)/carton



- L x W x H = 36cm x 36cm x 6.9cm

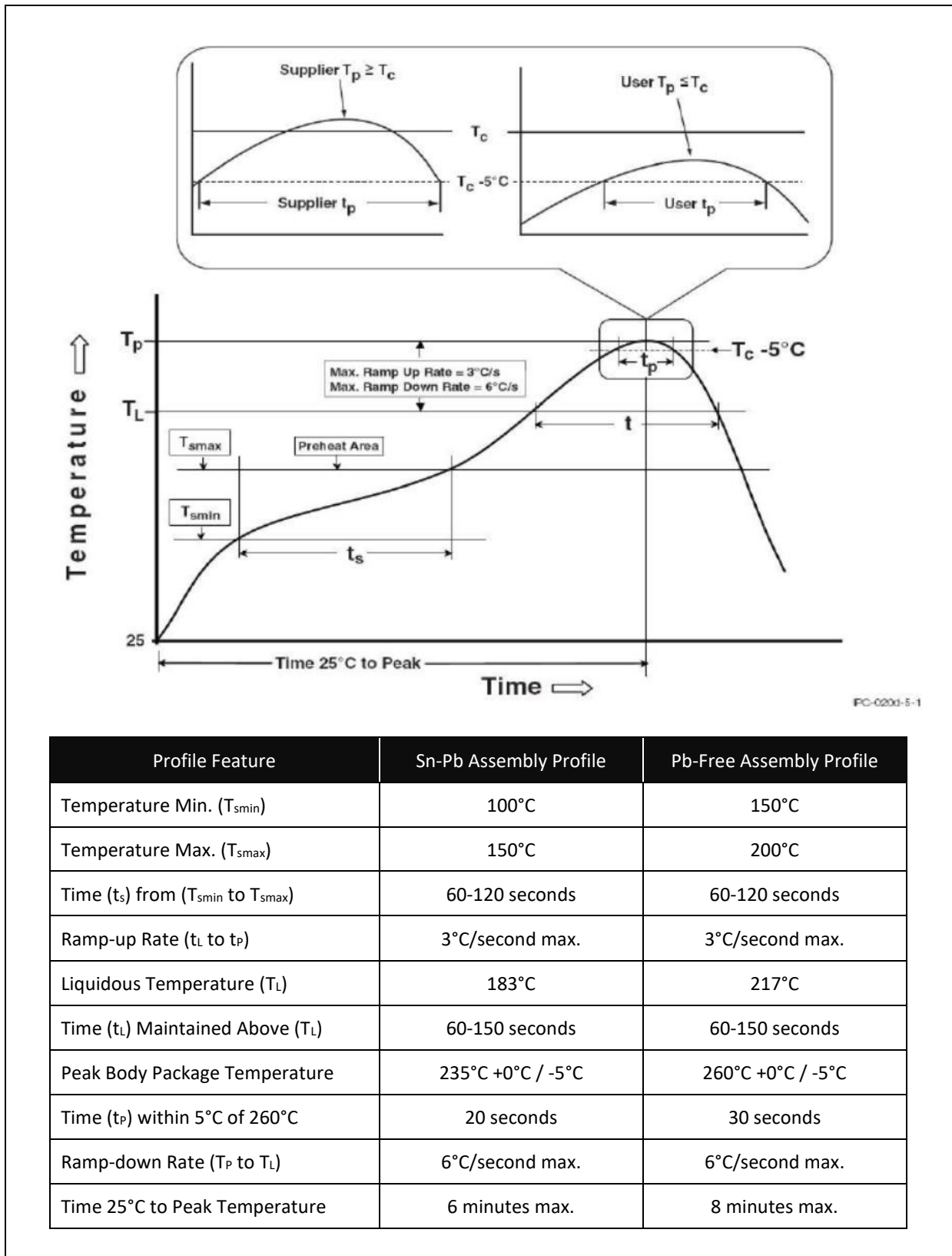


- L x W x H = 45cm x 38cm x 38cm

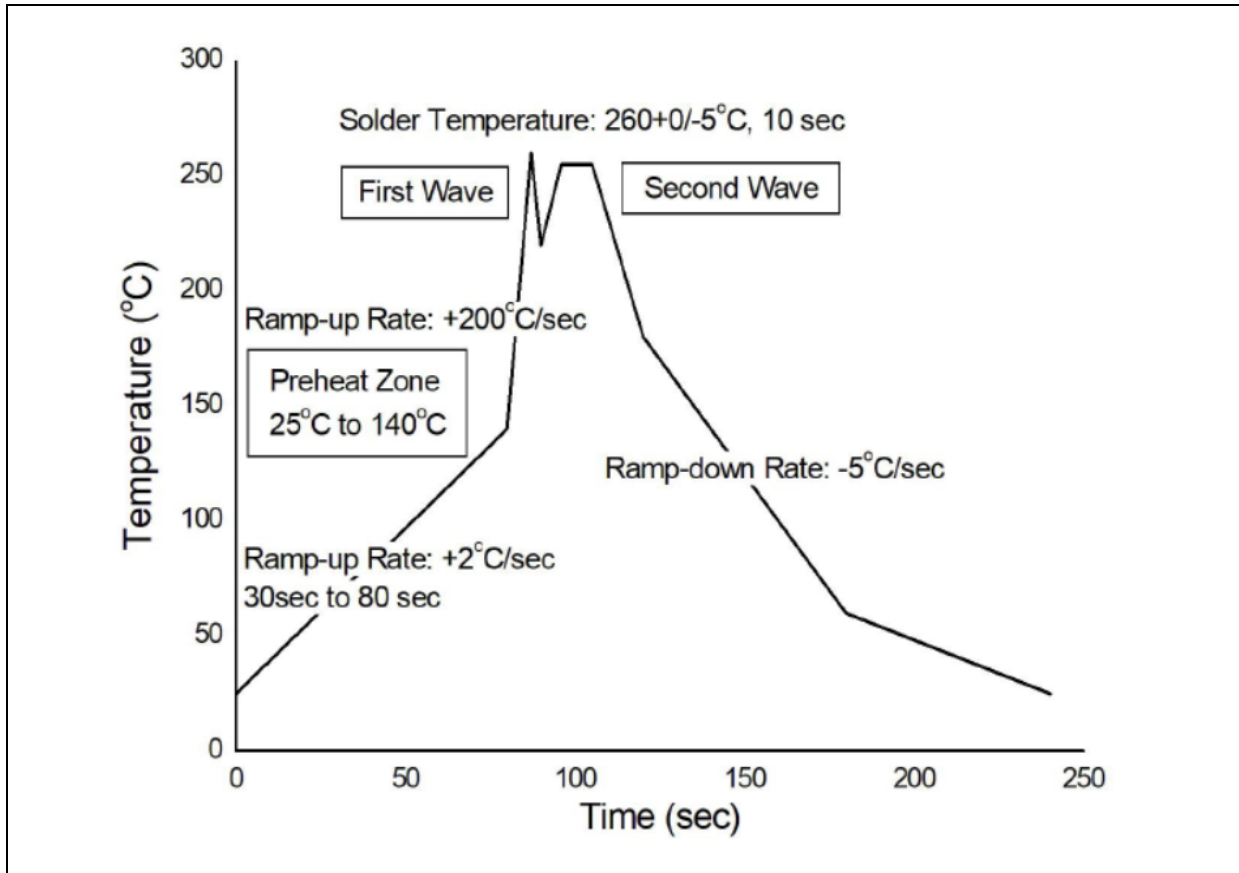


## RECOMMENDED SOLDERING PROFILE:

Reflow Information:



Wave Soldering (JESD22-A111 Compliant):



Hand Soldering:

|                       |            |
|-----------------------|------------|
| Soldering Temperature | 380±5°C    |
| Soldering Time        | 3 sec max. |

Note:

- One time soldering is recommended for all soldering methods.
- Do not solder more than three times for IR reflow soldering.